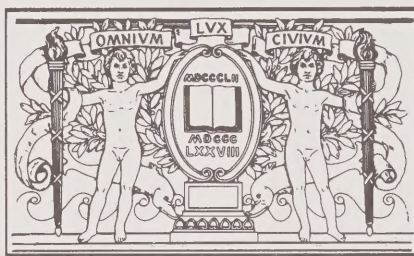


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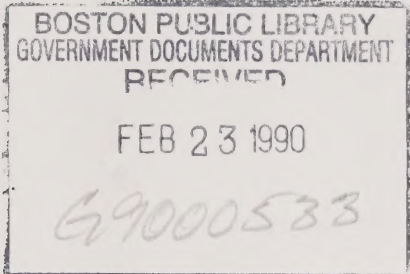
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**GROWTH TO THE YEAR 2000 IN THE CITY OF BOSTON
POPULATION PROJECTIONS**

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August, 1988

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Introduction

The population projections in this report were prepared as input to potential growth estimates in the City of Boston to the year 2000. As part of the "Boston 2000" growth plan, these projections set out paths of resident population growth that will go hand in hand with growth in other sectors, such as housing, labor force, land use, and development. The population growth numbers will become part of a whole that will include these other sectors and will enable an integrated view of Boston's future with the detail of anticipated change neighborhood by neighborhood that will combine to make up the city total. These population projections are also useful in planning for the needs of the city with respect to housing, education, jobs, healthcare, and other services.

The analysis and projections here presented may be considered as a sequel with updates, modifications and revisions of our September 1985 report, Population Projections for Boston and the Boston City Hospital Area, focusing on three alternatives. The "low" alternative is in tune with the U.S. Census Bureau population estimate for Boston for 1985. The "high" alternative agrees with the 1985 Boston population estimate of the Governor's Decennial Census Commission, with population projected as a function of job growth for the city, the metropolitan area, and the nation, as reported, respectively, by (1) the Boston Redevelopment Authority Research Department, (2) the U.S. Bureau of Economic Analysis, and (3) the U.S. Bureau of Labor Statistics, assuming a modest increase in the Boston resident worker job-capture rate for Boston jobs. The "middle" alternative is intermediate.

Executive Summary

The population projections presented here are part of the Boston 2000 Plan. They will be integrated with projections of housing, labor force, and land use to form an overall picture of the projected growth expected in Boston.

Three sets of projections of Boston's total population by age and sex are presented here. All are cohort-component projections which take account of births, deaths, and net migration in each five-year period between 1980 and 2000. The High Series is based on employment projections, --national (U.S. Bureau of Labor Statistics), metropolitan area (U.S. Bureau of Economic Analysis), and city (Boston Redevelopment Authority, Policy Development and Research Department)--, and assumes a modest increase in Boston resident worker participation in Boston jobs. Under this assumption, Boston's population would climb to 640,000 by 1990 and near 700,000 by 2000 in line with the projected economic growth in Boston. The Middle Series was based on the assumption that Boston's population would be 600,000 in 1990 and 640,000 in 2000. The Low Series was premised on developing projections consonant with the U.S. Bureau of the Census estimate of Boston's population in 1985 of some 572,000 persons, an increase from the 562,994 persons counted by the Census in 1980, and grow thereafter, to 580,000 in 1990 and 598,000 in 2000.

There are large differences in growth in the three series. The Low Series population grows at between 1 and 2 percent in each five-year period, with a total population of 598 thousand resulting in the year 2000. The Middle Series population grows at 3 to 4 percent in each period to a year 2000 total of 645 thousand. The initial growth in the High Series is over 6 percent which declines to under 5 percent by century's end yielding a total population of 699 thousand by the year 2000.

In all three projection series, the age groups tend to follow the same trends over the twenty-year period between 1980 and 2000, although the numbers differ. Preschoolers aged 0-4 show a steady upward trend and then level off. Children aged 5-14 years dip from 1980 to 1985 and rise thereafter as the children of the baby bust grow out of this age group and into the 15-24 year group. This age group declines through 1995 and then heads upward again between 1995 and 2000, ten years after this cohort contributed to the increase in the number of children aged 5-14. The 25-34 year group peaks in 1990 and then declines as the cohorts of the baby boom make their way into the 35-44 year group which more than doubles in size between 1980 and 2000. The numbers of those aged 45-54 head sharply upward during the 1990s as the cutting edge of the baby boom reaches this age group. The age group 55-64 languishes until 1995-2000 when the baby boom's heralds age sufficiently to increase this group. The age group 65-74 shows steady erosion as those cohorts diminished by out migration to the suburbs during the post-World War II decades and the smaller cohorts of the 1930s enter this age group. However, those aged

75 and over tend to increase moderately due to the countervailing forces of increasing longevity and smaller cohorts aging into this group.

Results of the Current Projections

The population projections are summarized in Table 1. There are large differences in the growth in the three series. The Low Series population grows at between 1 and 2 percent in each five-year period, with a total population of 598 thousand resulting in the year 2000. The Middle Series population grows at 3 to 4 percent to a year 2000 total of 645 thousand. The initial growth in the High Series is over 6 percent which declines to less than 5 percent by century's end yielding a total population of 699 thousand by the year 2000.

Table 1. City of Boston Population, 1985, and Summary Projections for 1990-2000

<u>Series</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
Low	571,621	579,602	585,614	597,669
Middle	579,631	601,730	620,564	645,207
High	601,305	639,682	668,702	699,067

Population Growth. The Low Series, shown in Tables 2 and 5, indicates that Boston's population grew to 571,620 in 1985, and would grow to 579,597 by 1990, to 586,612 by 1995, and to 597,669 by the year 2000. The increase is 8,628 (1.5 percent) for 1980-1985, and would be 7,975 (1.4 percent) for 1985-1990, 6,015 (1.0 percent) for 1990-1995, and 12,057 (2.1 percent) for 1995-2000. Overall growth for the twenty-year period would be 34,675 (6.2 percent), or 0.3 percent per annum, which is considerably less than the 0.9 percent annual rate of growth the U.S. Bureau of the Census foresees for the United States as a whole. Projected annual rates of population growth for Massachusetts range from 0.9 percent in the U.S. Bureau of Economic Analysis projections, to 0.3 percent in projections from the Massachusetts Institute for Social and Economic Research and the U.S. Bureau of the Census, to an average gain of 0.1 percent in the Joint Center for Housing Studies¹ projections for 1980-2000.

The Middle Series, seen in Tables 3 and 6, rises from 562,994 in 1980 to 579,632 in 1985, and projects growth in the population of Boston to 601,731 in 1990, 620,564 in 1995 and 645,207 in 2000. These changing population totals represent gains of 16,638 (3.0 percent) between 1980 and 1985, 22,099 (3.8 percent) in 1985-1990, 18,833 (3.1 percent) in 1990-1995, and 24,643 (4.0) in

1. George S. Masnick and John R. Pitkin, The Changing Population of States and Regions, Cambridge, MA: Joint Center for Housing of M.I.T. and Harvard, 1982.

Table 2. Population 1970-1985 and Projections for City of Boston to 2000, Low Series, with Percent Distribution and Percent Change

Age Groups	<u>Actual</u>		<u>Estimated</u>	<u>Projected</u>		
	1970	1980	1985	1990	1995	2000
NUMBER						
Total Ages	641,071	562,994	571,622	579,604	585,615	597,669
0-4	49,927	30,118	36,332	39,041	39,081	38,340
5-14	102,765	65,575	54,579	57,948	65,903	68,325
15-24	138,182	136,730	129,907	107,343	91,683	97,941
25-34	79,379	107,311	125,808	136,740	127,347	105,752
35-44	60,735	53,039	65,855	81,678	97,739	107,832
45-54	65,473	48,698	42,770	45,837	57,896	72,659
55-64	62,851	50,224	46,580	40,648	36,595	40,025
65-74	49,469	39,956	38,369	37,080	34,846	30,981
75+	32,290	31,343	31,422	33,289	34,526	35,814
PERCENT OF TOTAL						
Total Ages	100.0	100.0	100.0	100.0	100.0	100.0
0-4	7.8	5.3	6.4	6.7	6.7	6.4
5-14	16.0	11.6	9.5	10.0	11.3	11.4
15-24	21.6	24.3	22.7	18.5	15.7	16.4
25-34	12.4	19.1	22.0	23.6	21.7	17.7
35-44	9.5	9.4	11.5	14.1	16.7	18.0
45-54	10.2	8.6	7.5	7.9	9.9	12.2
55-64	9.8	8.9	8.1	7.0	6.2	6.7
65-74	7.7	7.1	6.7	6.4	6.0	5.2
75+	5.0	5.6	5.5	5.7	5.9	6.0
PERCENT CHANGE			<u>1980-1985</u>	<u>1985-1990</u>	<u>1990-1995</u>	<u>1995-2000</u>
Total Ages			1.5	1.4	1.0	2.1
0-4			20.6	-7.5	0.1	-1.9
5-14			-16.8	6.2	13.7	3.7
15-24			-5.0	-17.4	-14.6	6.8
25-34			17.2	8.7	-6.9	-17.0
35-44			24.2	24.0	19.7	10.3
45-54			-12.2	7.2	26.3	25.5
55-64			-7.3	-12.7	-10.0	9.4
65-74			-4.0	-3.4	-6.0	-11.1
75+			0.3	5.9	3.7	3.7

Table 3. Population 1980-1985 and Projections for City of Boston to 2000. Middle Series, with Percent Distribution and Percent Change

Age Groups	<u>Actual</u>	<u>Estimated</u>	<u>Projected</u>		
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
NUMBER					
All Ages	562,994	579,632	601,731	620,564	645,207
0-4	30,118	38,372	42,247	43,376	43,744
5-14	65,575	57,053	63,963	75,323	79,966
15-24	136,730	127,957	116,510	103,839	113,761
25-34	107,311	129,579	133,312	125,489	113,520
35-44	53,039	68,226	90,005	109,470	112,886
45-54	48,698	42,762	45,837	59,571	78,738
55-64	50,224	46,580	40,641	36,256	39,174
65-74	39,956	38,369	37,080	34,597	30,370
75+	31,343	30,734	32,136	32,643	33,048
PERCENT OF TOTAL					
All Ages	100.0	100.0	100.0	100.0	100.0
0-4	5.3	6.6	7.0	7.0	6.8
5-14	11.6	9.8	10.6	12.1	12.4
15-24	24.3	22.1	19.4	16.7	17.6
25-34	19.1	22.4	22.2	20.2	17.6
35-44	9.4	11.8	15.0	17.6	17.5
45-54	8.6	7.4	7.6	9.6	12.2
55-64	8.9	8.0	6.8	5.8	6.1
65-74	7.1	6.6	6.2	5.6	4.7
75+	5.6	5.3	5.3	5.3	5.1
PERCENT CHANGE					
		<u>1980-1985</u>	<u>1985-1990</u>	<u>1990-1995</u>	<u>1995-2000</u>
All Ages		3.0	3.8	3.1	4.0
0-4		27.4	10.1	2.7	0.8
5-14		-13.0	12.1	17.8	6.2
15-24		-6.4	-8.9	-10.9	9.6
25-34		20.8	2.9	-5.9	-9.5
35-44		28.6	31.9	21.6	3.1
45-54		-12.2	7.2	30.0	32.2
55-64		-7.3	-12.8	-10.8	8.0
65-74		-4.0	-3.4	-6.7	-12.2
75+		-1.9	4.6	1.6	1.2

Table 4. Population 1980-1985 and Projections for City of Boston to 2000.
High Series, with Percent Distribution and Percent Change

Age Groups	<u>Actual</u>	<u>Estimated</u>	<u>Projected</u>		
	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
NUMBER					
All Ages	562,994	601,305	639,682	668,702	699,067
0-4	30,118	38,909	45,045	47,112	47,674
5-14	65,575	57,053	64,384	78,318	85,912
15-24	136,730	138,096	121,973	102,754	112,182
25-34	107,311	134,528	151,803	149,998	127,525
35-44	53,039	69,670	93,052	116,236	129,802
45-54	48,698	43,938	48,121	63,335	84,329
55-64	50,224	47,876	42,302	38,290	42,140
65-74	39,956	39,583	39,106	37,399	33,135
75+	31,343	31,652	33,896	35,260	36,368
PERCENT OF TOTAL					
All Ages	100.0	100.0	100.0	100.0	100.0
0-4	5.3	6.5	7.0	7.0	6.8
5-14	11.6	9.5	10.1	11.7	12.3
15-24	24.3	23.0	19.1	15.4	16.0
25-34	19.1	22.4	23.7	22.4	18.2
35-44	9.4	11.6	14.5	17.4	18.6
45-54	8.6	7.3	7.5	9.5	12.1
55-64	8.9	8.0	6.6	5.7	6.0
65-74	7.1	6.6	6.1	5.6	4.7
75+	5.6	5.3	5.3	5.3	5.2
PERCENT CHANGE					
		<u>1980-1985</u>	<u>1985-1990</u>	<u>1990-1995</u>	<u>1995-2000</u>
All Ages		6.8	6.4	4.5	4.5
0-4		29.2	15.8	4.6	1.2
5-14		-13.0	12.8	21.6	9.7
15-24		1.0	-11.7	-15.8	9.2
25-34		25.4	12.8	-1.2	-15.0
35-44		31.4	33.6	24.9	11.7
45-54		-9.8	9.5	31.6	33.1
55-64		-4.7	-11.6	-9.5	10.1
65-74		-0.9	-1.2	-4.4	-11.4
75+		1.0	7.1	4.0	3.1

1995-2000. This implies a growth of 82,213 (14.6 percent) during the twenty year period. This translates into an annual rate of growth of 0.7 percent. This is more than double the annual rate of growth in the Low Series reflecting higher immigration to Boston, some of which would be illegal immigration probably.²

The High Series, seen in Tables 4 and 7, shows Boston's population growing to 601,305 in 1985, 639,682 in 1990, 668,702 in 1995, and 699,067 in the year 2000. This implies a growth of 38,311 (6.8 percent) between 1980 and 1985, 38,377 (6.4 percent) in 1985-1990, 29,020 (4.5 percent) in 1990-1995, and 30,365 (4.5 percent) in 1995-2000. In this tabulation, Boston's population would grow by 136,073 or 24.2 percent between 1980 and 2000, or by 1.2 percent per year. The Massachusetts State Decennial Census Commission determined that the 1985 population of Boston was 601,095 persons, very close to the High Series estimate for that year.

Age Distribution. In all three projection series, the age groups tend to follow the same trends over the twenty year period between 1980 and 2000, although the absolute numbers differ. Preschoolers aged 0-4 show a steady upward trend and then level off. Children aged 5-14 years dip from 1980 to 1985 and rise thereafter as the children of the baby bust grow out of this age group and into the 15-24 year group. This age group declines through 1995 and then heads upward again between 1995 and 2000, ten years after this cohort contributed to the increase in the number of children aged 5-14. The 25-34 year group peaks in 1990 and then declines as the cohorts of the baby boom make their way into the 35-44 year group which more than doubles in size during the 20 year interval. The numbers of those aged 45-54 head sharply upward during the 1990s as the cutting edge of the Baby Boom reaches this age group. The age group 55-64 languishes until 1995-2000 when the baby boom's heralds age sufficiently to increase this group. The age group 65-74 shows steady erosion as those cohorts diminished by outmigration to the suburbs during the post World War II decades and those smaller cohorts of the

². The number of immigrants, both legal and illegal is difficult to estimate because of their tendency not to respond to censuses and surveys. This is due to both a lack of facility in English and their desire not to be identified for a variety of reasons. Therefore, estimates are made on the basis of incomplete information. Reliable estimates are hard to find. The Immigration and Naturalization Service estimated that there were some 60,000 immigrants living in Massachusetts, Rhode Island, and New Hampshire who had arrived before 1982 and might apply for legalization in 1988. Those applying numbered less than 9,000, which leaves the actual number in doubt because of the wide discrepancy between the actual and the expected. The South Cove Community Health Center estimated that some 4,000 Asians in the City of Boston were missed by the 1980 U.S. Census.

Table 5. Population 1970-1985 and Projections for City of Boston by Sex and Five-Year Age Groups to 2000, Low Series

Age Groups	Actual		Estimated	Projected		
	1970	1980	1985	1990	1990	2000
BOTH SEXES	641,071	562,994	571,621	579,602	585,614	597,669
0-4	49,927	30,118	36,332	39,041	39,081	38,340
5-9	51,707	29,610	27,018	32,751	35,300	35,339
10-14	51,058	35,965	27,561	25,197	30,603	32,986
15-19	61,064	55,545	46,622	37,392	35,141	44,081
20-24	77,118	81,185	83,285	69,951	56,542	53,860
25-29	47,925	62,972	72,676	74,828	63,055	51,135
30-34	31,454	44,339	53,132	61,912	64,292	54,617
35-39	29,108	29,803	38,073	46,142	54,648	56,768
40-44	31,627	23,236	27,782	35,536	43,091	51,064
45-49	32,806	22,912	21,187	25,840	33,470	40,976
50-54	32,667	25,786	21,583	19,997	24,426	31,683
55-59	32,096	26,161	23,184	19,818	18,573	22,834
60-64	30,755	24,063	23,396	20,830	18,022	17,191
65-69	26,891	21,881	20,732	20,250	18,092	15,706
70-74	22,578	18,075	17,637	16,830	16,754	15,275
75-79	15,933	14,115	13,392	13,491	13,146	13,290
80-84	9,805	9,551	9,605	9,330	9,736	9,590
85+	6,552	7,677	8,425	10,468	11,644	12,934
MALE						
0-4	25,382	15,399	18,267	19,948	19,967	19,589
5-9	26,251	15,009	13,908	16,580	18,154	18,174
10-14	25,925	18,211	13,959	12,960	15,480	16,952
15-19	28,282	27,507	22,682	18,112	17,428	20,981
20-24	33,214	39,493	40,284	33,231	26,966	26,473
25-29	23,630	31,263	35,644	36,483	30,190	24,571
30-34	15,528	22,091	26,522	30,448	31,425	26,212
35-39	14,221	14,673	18,914	23,096	26,939	27,814
40-44	15,016	11,166	13,628	17,596	21,502	25,097
45-49	15,302	10,941	10,041	12,518	16,401	20,270
50-54	14,769	11,976	10,164	9,354	11,690	15,348
55-59	13,856	11,989	10,686	9,234	8,600	10,844
60-64	13,045	10,527	10,539	9,461	8,276	7,838
65-69	10,906	8,747	8,684	8,774	7,921	6,966
70-74	8,413	6,793	6,662	6,696	6,911	6,379
75-79	5,972	4,707	4,585	4,665	4,815	5,067
80-84	3,396	2,852	2,861	2,864	3,008	3,150
85+	2,132	2,182	2,100	2,473	2,696	2,961

continued

Table 5 continued. Population 1970-1985 and Projections for City of Boston by Sex and Five-Year Age Groups to 2000, Low Series

Age Groups	<u>Actual</u>		<u>Estimated</u>	<u>Projected</u>		
	<u>1970</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1990</u>	<u>2000</u>
FEMALE						
0-4	24,545	14,719	18,064	19,093	19,114	18,751
5-9	25,456	14,601	13,110	16,171	17,145	17,166
10-14	25,133	17,754	13,602	12,237	15,122	16,033
15-19	32,782	28,038	23,940	19,280	17,713	23,100
20-24	43,904	41,692	43,002	36,720	29,575	27,386
25-29	24,295	31,709	37,032	38,345	32,864	26,564
30-34	15,926	22,248	26,610	31,463	32,868	28,405
35-39	14,887	15,130	19,159	23,046	27,709	28,955
40-44	16,611	12,070	14,153	17,940	21,589	25,967
45-49	17,504	11,971	11,146	13,321	17,069	20,706
50-54	17,898	13,810	11,418	10,643	12,736	16,335
55-59	18,240	14,172	12,499	10,584	9,973	11,990
60-64	17,710	13,536	12,858	11,369	9,746	9,353
65-69	15,985	13,134	12,048	11,476	10,170	8,740
70-74	14,165	11,282	10,975	10,133	9,842	8,896
75-79	9,961	9,408	8,808	8,825	8,331	8,223
80-84	6,409	6,699	6,744	6,466	6,728	6,440
85+	4,420	5,495	6,324	7,995	8,948	9,973

Table 6. Population 1970-1985 and Projections for City of Boston
by Sex and Five-Year Age Groups to 2000, Middle Series

Age Groups	Actual		Estimated	Projected		
	1970	1980	1985	1990	1995	2000
BOTH SEXES	641,071	562,994	579,631	601,730	620,564	645,207
0-4	49,927	30,118	38,372	42,247	43,376	43,744
5-9	51,707	29,610	28,503	36,440	40,131	41,209
10-14	51,058	35,965	28,550	27,523	35,192	38,757
15-19	61,064	55,545	53,084	44,893	43,258	55,390
20-24	77,118	81,185	74,873	71,617	60,581	58,371
25-29	47,925	62,972	72,676	67,273	64,344	55,021
30-34	31,454	44,339	56,903	66,039	61,145	58,499
35-39	29,108	29,803	40,444	52,255	60,671	56,194
40-44	31,627	23,236	27,782	37,750	48,799	56,692
45-49	32,806	22,912	21,187	25,840	35,145	45,470
50-54	32,667	25,786	21,575	19,997	24,426	33,268
55-59	32,096	26,161	23,184	19,811	18,409	22,537
60-64	30,755	24,063	23,396	20,830	17,847	16,637
65-69	26,891	21,881	20,732	20,250	18,092	15,553
70-74	22,578	18,075	17,637	16,830	16,505	14,817
75-79	15,933	14,115	13,393	13,491	12,948	12,767
80-84	9,805	9,551	9,605	9,330	9,526	9,244
85+	6,552	7,677	7,736	9,315	10,169	11,037
MALE						
0-4	25,382	15,399	19,197	21,563	22,139	22,328
5-9	26,251	15,009	14,616	18,287	20,545	21,098
10-14	25,925	18,211	14,471	14,106	17,652	19,833
15-19	28,282	27,507	25,412	21,396	20,863	26,110
20-24	33,214	39,493	36,384	33,627	28,319	27,619
25-29	23,630	31,263	35,644	32,952	30,464	25,905
30-34	15,528	22,091	28,303	32,398	29,961	27,710
35-39	14,221	14,673	20,094	26,004	29,785	27,555
40-44	15,016	11,166	13,628	18,694	24,209	27,748
45-49	15,302	10,941	10,041	12,518	17,196	22,294
50-54	14,769	11,976	10,160	9,354	11,690	16,091
55-59	13,856	11,989	10,686	9,230	8,529	10,695
60-64	13,045	10,527	10,539	9,461	8,206	7,617
65-69	10,906	8,747	8,684	8,774	7,921	6,907
70-74	8,413	6,793	6,662	6,696	6,814	6,197
75-79	5,972	4,707	4,585	4,665	4,738	4,864
80-84	3,396	2,852	2,861	2,864	2,956	3,046
85+	2,132	2,182	1,929	2,210	2,378	2,567

continued

Table 6 continued. Population 1970-1985 and Projections for City of Boston by Sex and Five-Year Age Groups to 2000, Middle Series

Age Groups	<u>Actual</u>		<u>Estimated</u>	<u>Projected</u>		
	1970	1980	1985	1990	1995	2000
FEMALE						
0-4	24,545	14,719	19,175	20,684	21,237	21,416
5-9	25,456	14,601	13,887	18,153	19,586	20,111
10-14	25,133	17,754	14,079	13,417	17,540	18,924
15-19	32,782	28,038	27,672	23,497	22,395	29,280
20-24	43,904	41,692	38,489	37,990	32,262	30,752
25-29	24,295	31,709	37,032	34,321	33,880	29,116
30-34	15,926	22,248	28,600	33,641	31,184	30,789
35-39	14,887	15,130	20,350	26,251	30,886	28,639
40-44	16,611	12,070	14,153	19,056	24,590	28,944
45-49	17,504	11,971	11,146	13,321	17,949	23,176
50-54	17,898	13,810	11,415	10,643	12,736	17,177
55-59	18,240	14,172	12,499	10,581	9,880	11,842
60-64	17,710	13,536	12,858	11,369	9,642	9,020
65-69	15,985	13,134	12,048	11,476	10,170	8,646
70-74	14,165	11,282	10,975	10,133	9,691	8,620
75-79	9,961	9,408	8,808	8,825	8,210	7,903
80-84	6,409	6,699	6,744	6,466	6,570	6,198
85+	4,420	5,495	5,808	7,105	7,791	8,470

Table 7. Population 1970-1985 and Projections for City of Boston
by Sex and Five-Year Age Groups to 2000, High Series

Age Groups	Actual		Estimated	Projected		
	1970	1980	1985	1990	1995	2000
BOTH SEXES	641,071	562,994	601,305	639,682	668,702	699,067
0-4	49,927	30,118	38,909	45,045	47,112	47,674
5-9	51,707	29,610	28,503	36,897	42,732	44,698
10-14	51,058	35,965	28,550	27,487	35,586	41,214
15-19	61,064	55,545	52,007	41,288	39,734	51,543
20-24	77,118	81,185	86,089	80,685	63,020	60,639
25-59	47,925	62,972	76,683	81,341	75,846	58,936
30-34	31,454	44,339	57,845	70,462	74,152	68,589
35-39	29,108	29,803	41,038	53,576	64,823	67,744
40-44	31,627	23,236	28,632	39,476	51,413	62,058
45-49	32,806	22,912	22,012	27,088	37,354	48,508
50-54	32,667	25,786	21,926	21,033	25,981	35,821
55-59	32,096	26,161	23,930	20,365	19,557	24,136
60-64	30,755	24,063	23,946	21,937	18,733	18,004
65-69	26,891	21,881	21,279	21,227	19,511	16,671
70-74	22,578	18,075	18,304	17,879	17,888	16,464
75-79	15,933	14,115	14,003	14,385	14,121	14,145
80-84	9,805	9,551	9,913	10,022	10,449	10,336
85+	6,552	7,677	7,736	9,489	10,690	11,887
MALE						
0-4	25,382	15,399	19,197	22,991	24,047	24,335
5-9	26,251	15,009	14,616	18,264	21,878	22,886
10-14	25,925	18,211	14,471	14,095	17,615	21,102
15-19	28,282	27,507	24,957	19,836	19,325	24,155
20-24	33,214	39,493	41,583	37,743	29,536	28,782
25-59	23,630	31,263	37,385	39,383	35,591	27,726
30-34	15,528	22,091	28,746	34,388	35,957	32,254
35-39	14,221	14,673	20,390	26,553	31,554	32,756
40-44	15,016	11,166	14,048	19,553	25,405	30,121
45-49	15,302	10,941	10,479	13,176	18,343	23,760
50-54	14,769	11,976	10,353	9,905	12,514	17,425
55-59	13,856	11,989	10,988	9,519	9,133	11,545
60-64	13,045	10,527	10,751	9,898	8,616	8,288
65-69	10,906	8,747	8,936	9,193	8,504	7,421
70-74	8,413	6,793	6,900	7,117	7,369	6,843
75-79	5,972	4,707	4,808	4,974	5,177	5,383
80-84	3,396	2,852	2,941	3,073	3,230	3,402
85+	2,132	2,182	1,929	2,248	2,506	2,769

continued

Table 7 continued. Population 1970-1985 and Projections for City of Boston by Sex and Five-Year Age Groups to 2000, High Series

Age Groups	<u>Actual</u>		<u>Estimated</u>	<u>Projected</u>		
	<u>1970</u>	<u>1980</u>	<u>1985</u>	<u>1990</u>	<u>1995</u>	<u>2000</u>
FEMALE						
0-4	24,545	14,719	19,712	22,054	23,065	23,339
5-9	25,456	14,601	13,887	18,633	20,854	21,812
10-14	25,133	17,754	14,079	13,392	17,971	20,112
15-19	32,782	28,038	27,050	21,453	20,408	27,388
20-24	43,904	41,692	44,506	42,942	33,484	31,857
25-29	24,295	31,709	39,298	41,958	40,255	31,210
30-34	15,926	22,248	29,099	36,074	38,195	36,335
35-39	14,887	15,130	20,648	27,023	33,269	34,979
40-44	16,611	12,070	14,584	19,923	26,008	31,937
45-49	17,504	11,971	11,533	13,912	19,011	24,748
50-54	17,898	13,810	11,573	11,128	13,467	18,396
55-59	18,240	14,172	12,942	10,846	10,424	12,591
60-64	17,710	13,536	13,194	12,039	10,117	9,716
65-69	15,985	13,134	12,343	12,034	11,007	9,250
70-74	14,165	11,282	11,404	10,762	10,519	9,621
75-79	9,961	9,408	9,195	9,411	8,944	8,762
80-84	6,409	6,699	6,972	6,949	7,219	6,934
85+	4,420	5,495	5,808	7,241	8,184	9,118

1930s enter this age group. However, the group aged 75 and over tends to increase moderately due to the countervailing forces of increasing longevity and smaller cohorts aging into this group. Therefore, while those age 85 and over grow in all three series, projections of those aged 75-84 vary.

Nonetheless, there are differences among the series in the age distribution. The Low Series has a higher proportion of elderly aged 65 and over, and of those aged 45-64, and a lower proportion of young children aged 0-14 than the other two series. The Middle Series has a higher proportion of its population in the 15-24 age group than either of the High or the Low series. The High Series tends to have higher proportions in the middle age groups of 25-44. This indicates three different sets of assumptions about population growth in Boston. The Low Series assumes a tendency to increased immigration of young adults and higher retention rates among older residents. The Middle Series lends itself to the view that Boston will attract increasing numbers of young adults starting college or careers who will tend to remain in the city. The High Series supports the contention that young adults will come in larger numbers, but that the middle aged group with a preference for urban living and the ability to afford the housing market will be relatively more important than young adults in the population. Graphs 1 through 3 show the different shapes of the population curves for the three series.

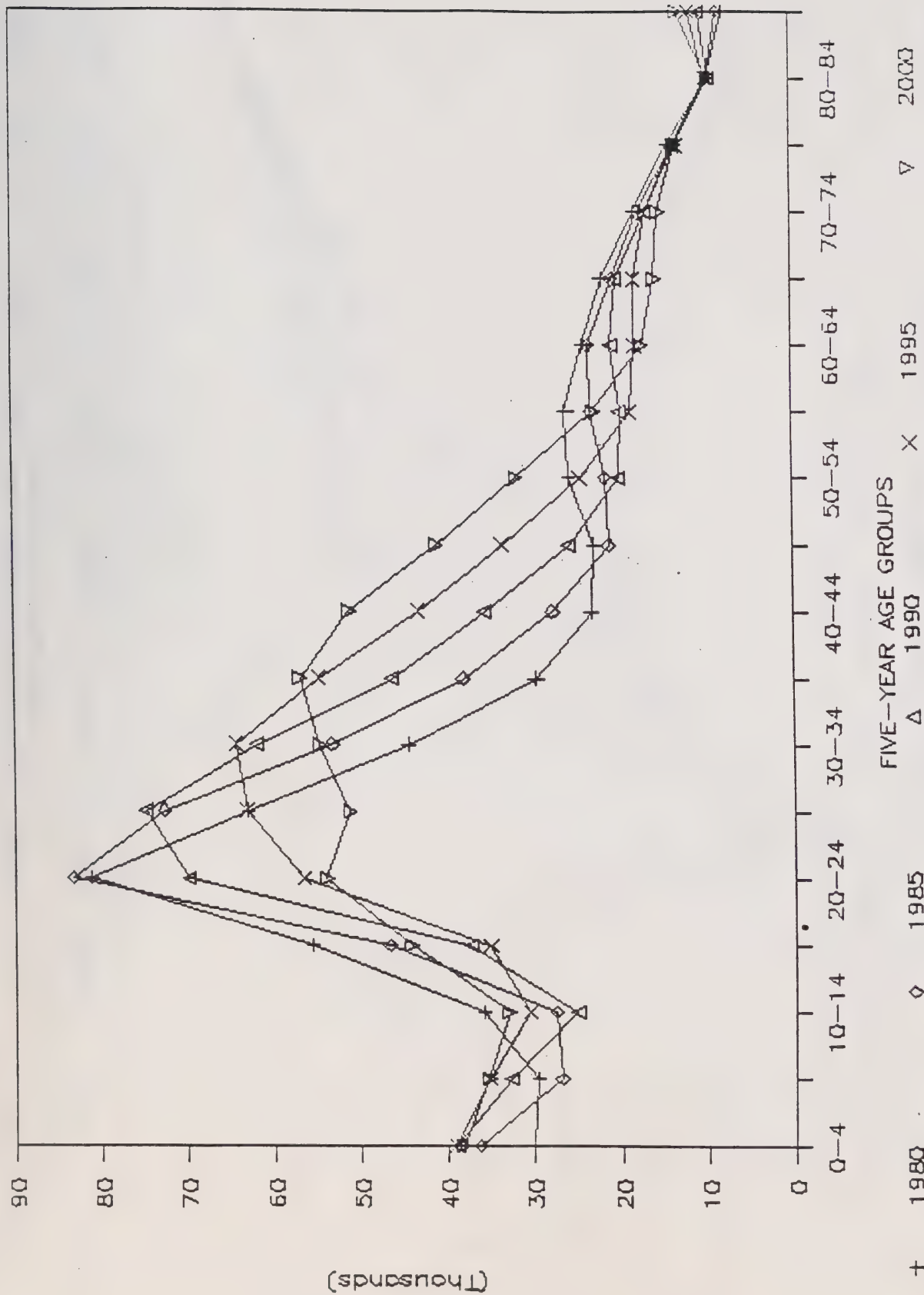
Graphs 4 through 6 indicate visually the changing size of each five-year cohort over time. The slopes of the lines indicate the size of the combined effect of mortality and migration on each cohort in each five-year period between 1980 and 2000.

Despite similarities in the patterns of change by age group, there are important differences in the projected number of persons in each age group. This is due both to the differences in the total population numbers and to the different assumptions mentioned above that the migration rates portray.

Among children and young adults up to age 14, there are considerable differences among the three series, seen in Tables 2 to 4. The number of children 0-4 grows from some 30 thousand in 1980 to 38 thousand by the year 2000 in the Low Series, to 44 thousand in the Middle Series and to 48 thousand in the High Series by the year 2000. These represent gains over the twenty year period of 27, 45, and 58 percent, respectively. Children aged 5-14 are expected in the Low Series to grow by just 4 percent, from 66 thousand to 68 thousand. The Middle Series projects this age group at 80 thousand by the year 2000, an increase of 22 percent, while the High Series foresees a 31 percent increase to 86 thousand. The larger numbers represent both more young adults of childbearing age moving to Boston and young families with children having a higher propensity to remain in Boston rather than move out.

POPULATION PROJECTIONS BY AGE GROUPS,

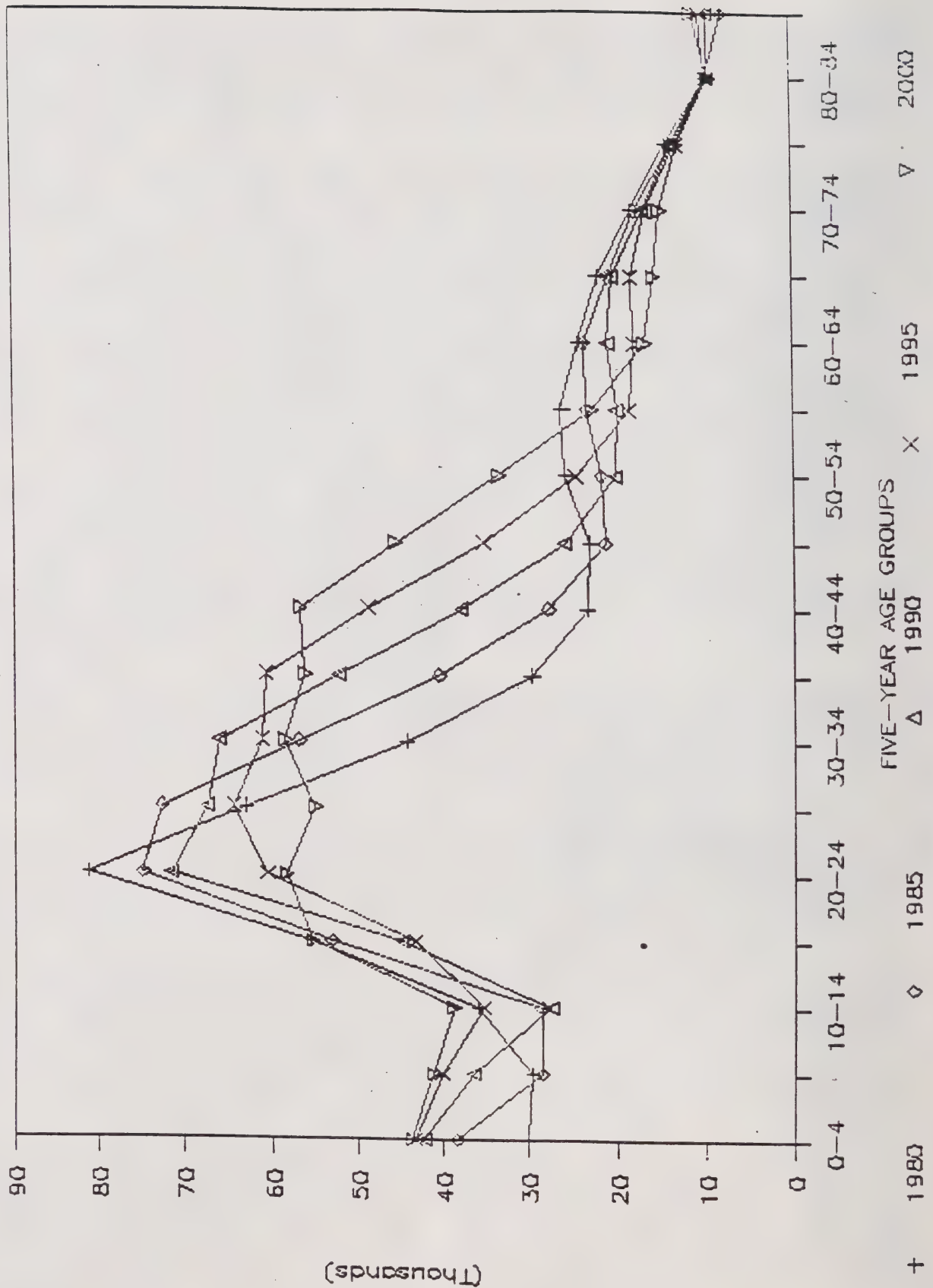
LOW SERIES, BOSTON, 1980 TO 2000



Graph 1

POPULATION PROJECTIONS BY AGE GROUPS,

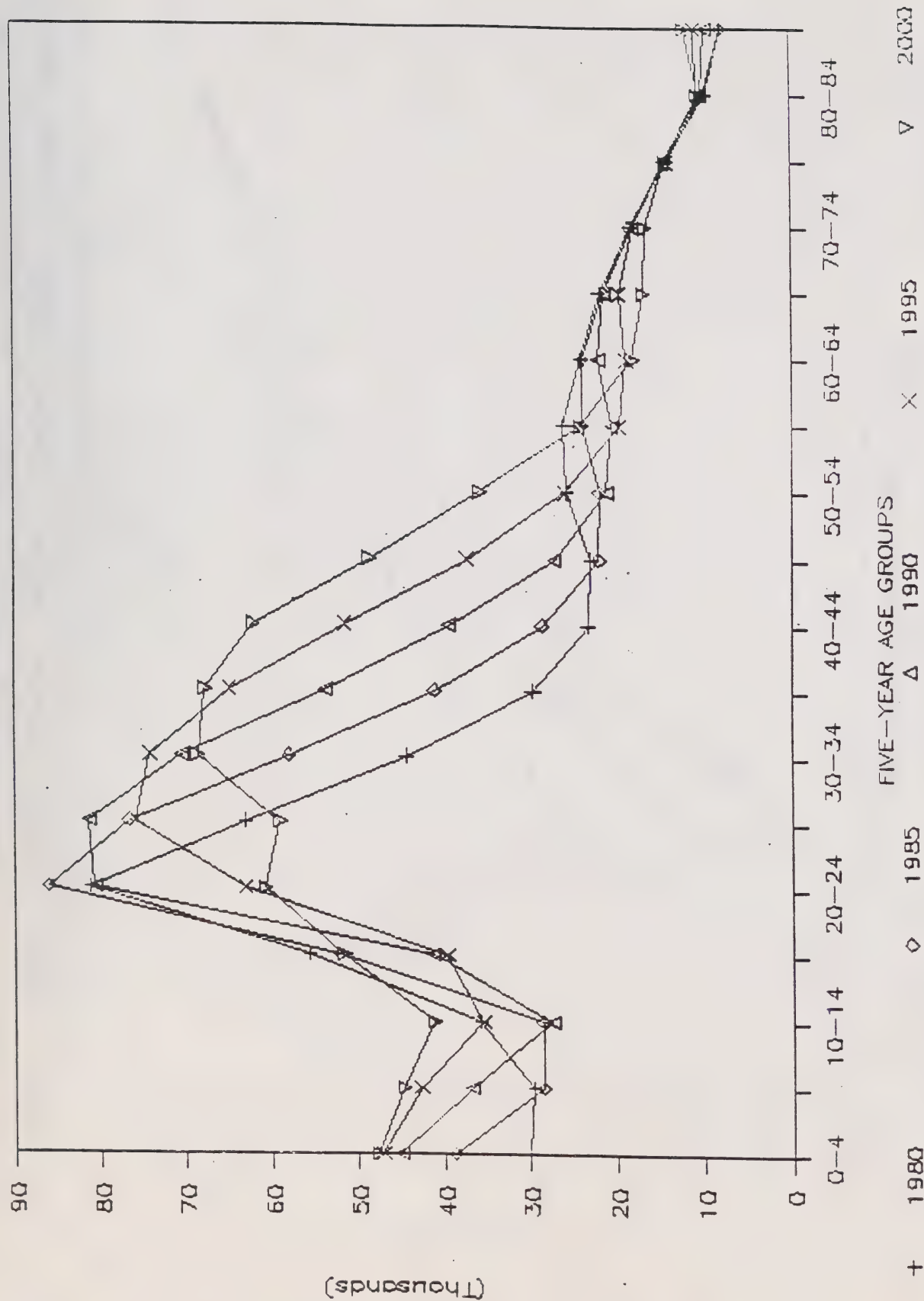
MIDDLE SERIES, BOSTON, 1980 TO 2000



Graph 2

POPULATION PROJECTIONS BY AGE COHORTS

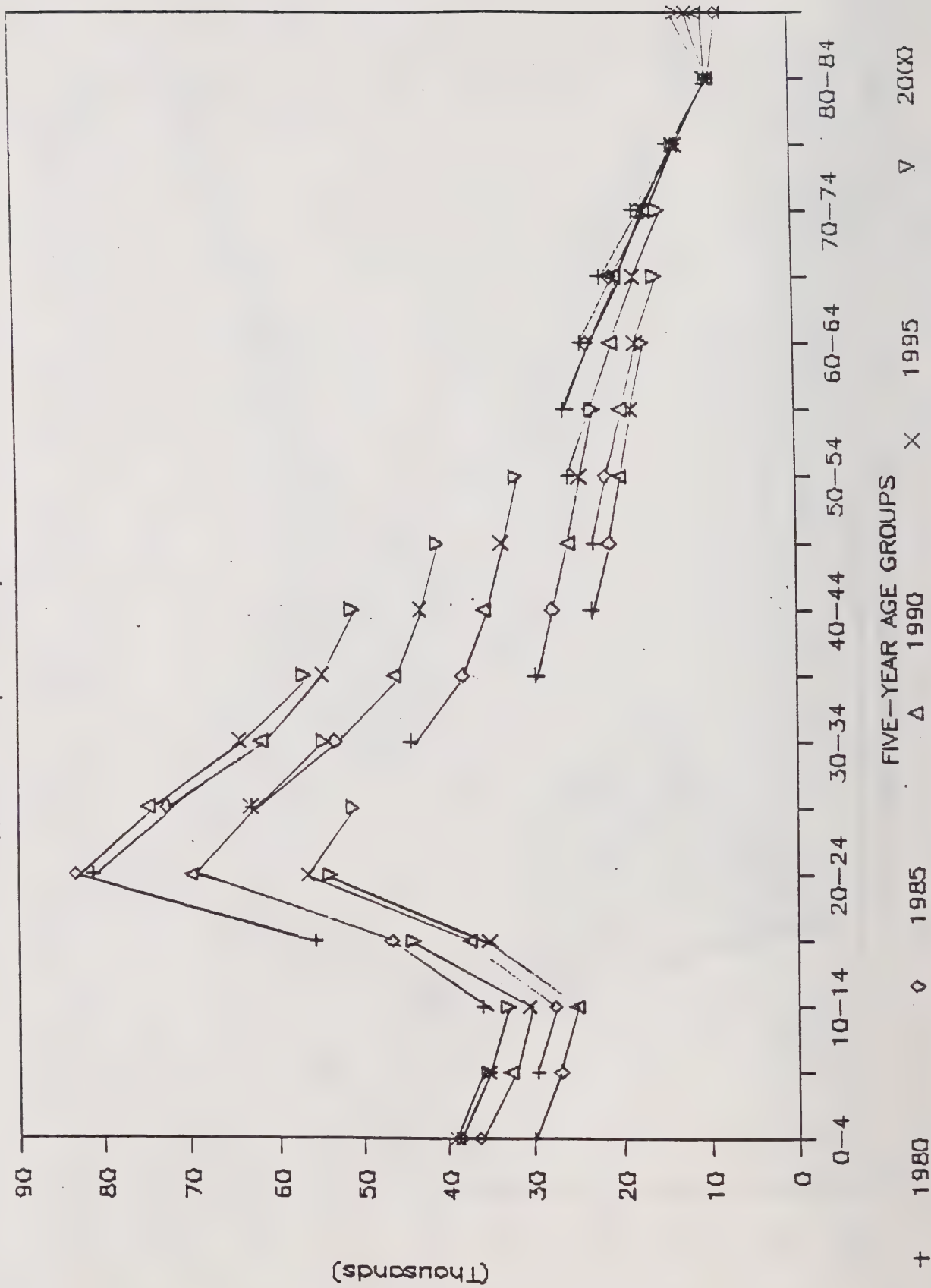
HIGH SERIES, BOSTON, 1980 TO 2000



Graph 3

POPULATION PROJECTIONS BY AGE COHORTS

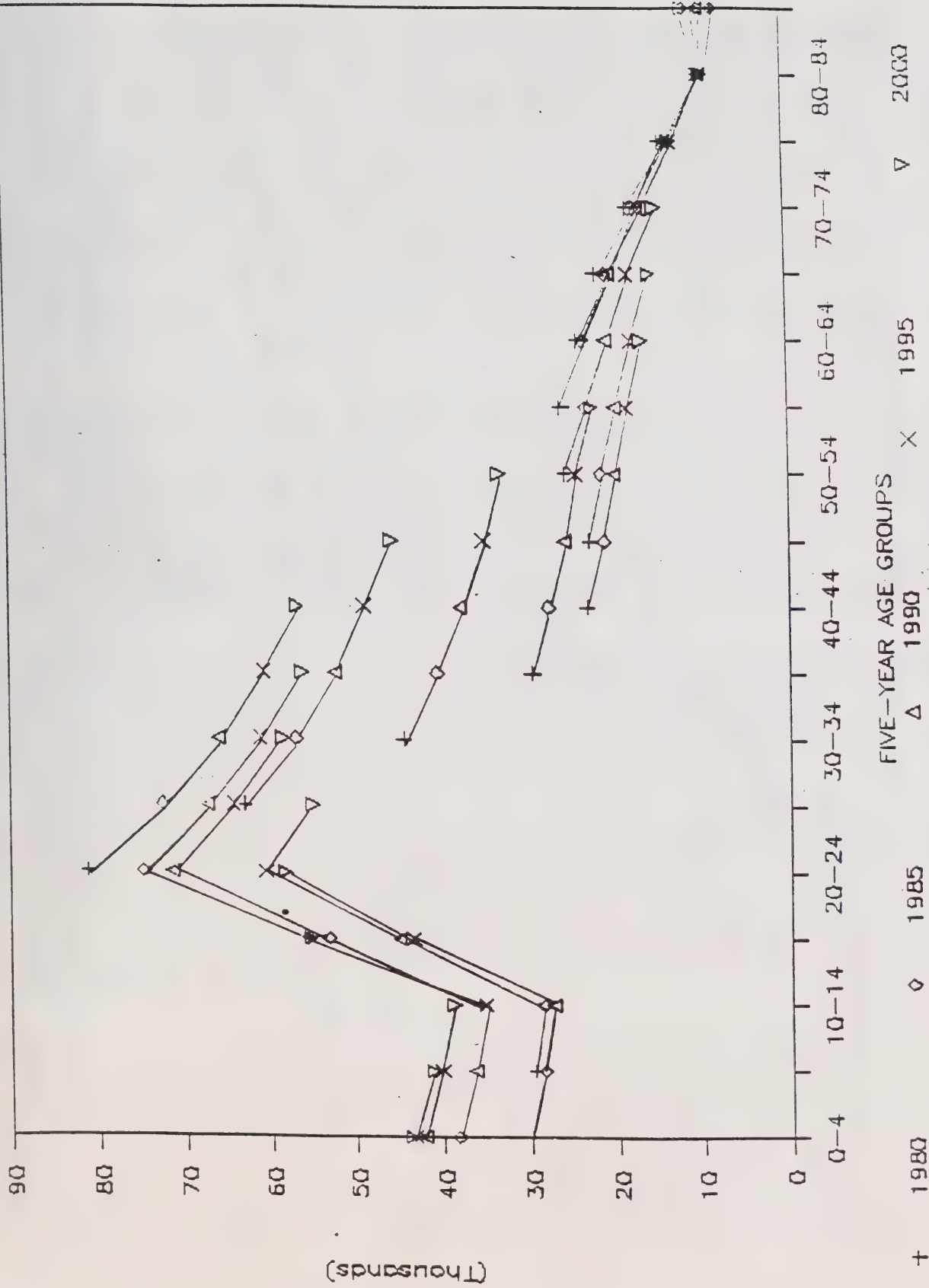
LOW SERIES, BOSTON, 1980 TO 2000



Graph 4

POPULATION PROJECTIONS BY AGE COHORTS

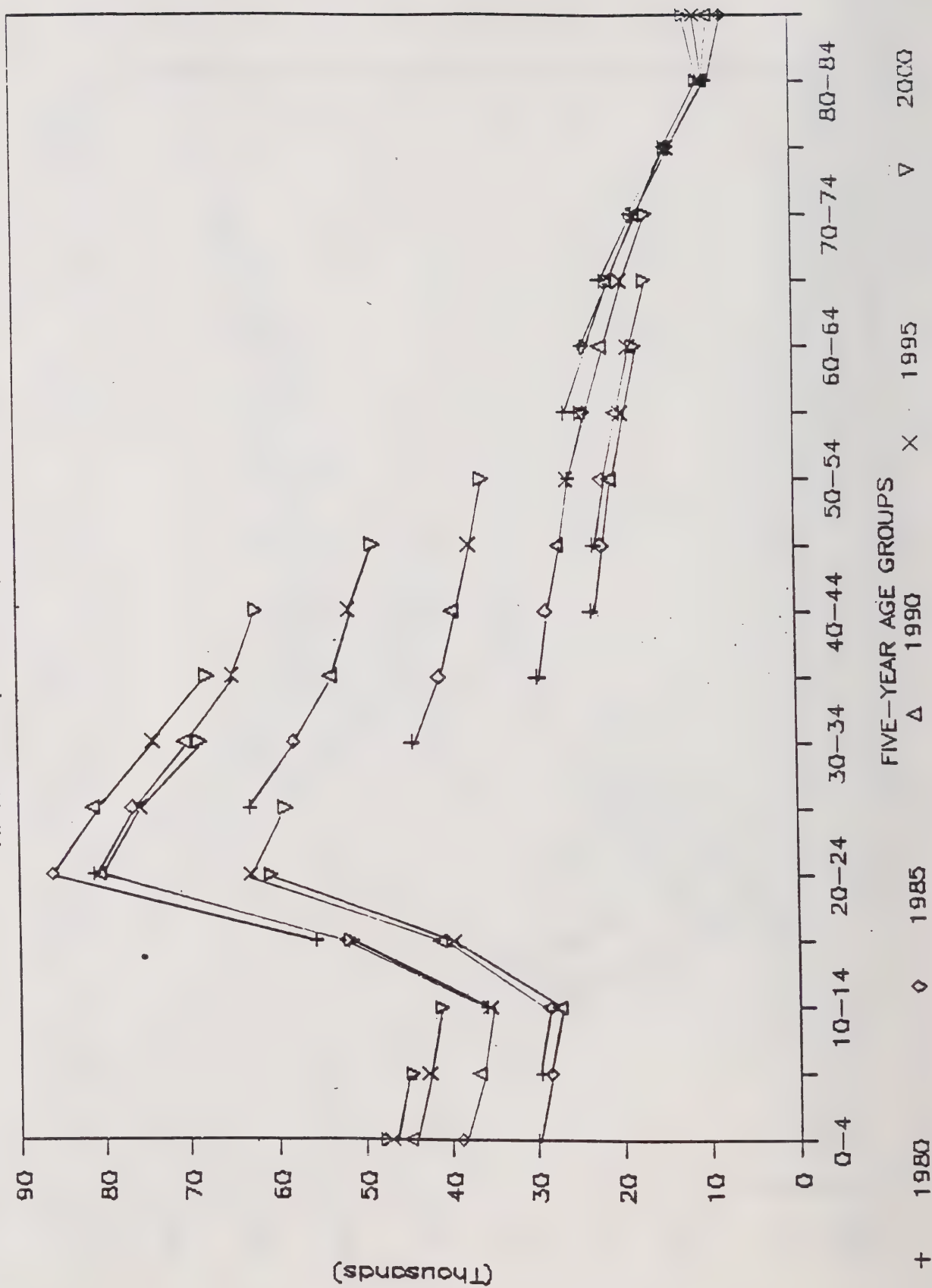
MIDDLE SERIES, BOSTON, 1980 TO 2000



Graph 5

POPULATION PROJECTIONS BY AGE COHORTS

HIGH SERIES, BOSTON, 1980 TO 2000



Graph 6

Among young people aged 15-24, the Low Series projects a decline of one-third to 92 thousand in 1995, with subsequent growth to 98 thousand by the year 2000. The Middle and High Series show losses of 24 and 25 percent in this age group between 1980 and 1995, to 104 and 103 thousand, respectively, with gains of some 10 thousand between 1995 and 2000. These numbers decline as the large cohorts born during the 1960s are replaced by the small cohorts of the 1970s and these are replaced in turn by the somewhat larger cohorts of the 1980s. The projected numbers indicate different assumptions about Boston's ability to attract young people for higher education and entry level jobs in the face of a national decline in this age group of 20 percent, and a 46 percent shrinkage of the size of the initial birth cohorts for these age groups in Boston.

The number of young adults aged 25-34 in the Low Series will grow 27 percent during the 1980s from 107 thousand in 1980 to 137 thousand in 1990, then decline by 23 percent to 106 thousand by 2000. The Middle Series projects a 24 percent gain in this age group by 1990 to 133 thousand, followed by an 18 percent decline to 114 thousand in 2000. A gain of 41 percent to 152 thousand in 1990 is projected in the High Series with a fall off of 16 percent to 128 thousand by the year 2000. The series reflect different likelihoods of young adults remaining in Boston, rather than moving out as they had been doing in the 1970s.

These underlying likelihoods are also reflected in the projected numbers of those aged 35-44, which grow steadily between 1980 and 2000 but with considerable differences among the three series. The Low and Middle Series project a doubling of this group from 53 thousand in 1980 to 108 thousand and 113 thousand, respectively, in 2000. The High Series projects the number of 35-44 years olds to be 130 thousand, or nearly two-and-a-half times their 1980 numbers, by the year 2000. Similarly, the 45-54 group grows in all three projections, from 49 thousand in 1980, after a dip in 1985, through the year 2000. The end of century projections for this age group are 73 thousand, a gain of 49 percent, in the Low Series, 79 thousand, representing a gain of 62 percent, in the Middle Series and 84 thousand in the High Series, a gain of 73 percent.

Differences among the series are less dramatic for the older age groups. All three show moderate declines for those 55-64 years: from 50 thousand in 1980 to 40 thousand in the Low Series, 39 thousand in the Middle Series, and 42 thousand in the High Series by the year 2000. For those 65-74, the declines are from 40 thousand in 1980 to 31, 30, and 33 thousand, respectively by the year 2000. For those 75 years and older, modest increases are projected between 1980 and 2000 from 31 thousand to 33 thousand in the Middle Series and to 36 thousand in the Low Series and in the High Series.

Methodology

Overview. Three sets of population projections have been prepared for the period 1980 to 2000. These population projections are part of a model that links changes in population with those in the labor force and housing over the twenty-year period. In general, they follow the three series prepared for the Boston City Hospital (BCH) in a 1985 BRA study: Low Series (C), Middle Series (A), and High Series (B).³ In the study, the Low Series was premised on developing population projections that would fit with the U.S. Bureau of the Census' estimate of Boston's 1985 population, of approximately 572,000. The Middle Series was based on the assumption that Boston's population of nearly 563,000 in 1980 would reach 600,000 in 1990 and 640,000 in 2000. The High Series assumed in 1985 that Boston's population would climb to 640,000 by 1990 and 700,000 by 2000. These underlying assumptions of the BCH projections remained the guiding principles for the new projection series.

While the new estimates of total population for 1985 and the projections for 1990, 1995, and 2000 closely resemble those of the BCH Series A, B, and C, some modifications were made to the original BCH series. Most importantly, all three of the new series presented in the paper are cohort-component projections that account for births, deaths, and migration and project age distributions. In the original BCH projections, the Low Series (C) was a cohort-component projection based on age-sex specific death and migration rates and birth rates developed from an estimated current general fertility rate. The new Low Series is similar with a few adjustments in migration rates. The Middle Series (A) contained birth and death components that were based on estimated recent deaths and an estimated general fertility rate that differed somewhat from that used in the Low Series. Numbers of migrants were allocated to the various age groups. The new Middle Series uses birth and death rates identical to those used in the Low Series and a new set of age-sex specific migration rates. The High Series (B) contained total population for each date but no age distribution. The population totals in the High Series were predicated on a relationship between general economic growth of Boston and the population that might be expected to accompany that growth. The new High Series takes into account birth, death, and migration rates in developing an age distribution, thus basing all three projections in age cohorts.

Migration. The new Low Series had small adjustments made to the age distribution through migration rates. The net effect was to

3. Anne Hafrey and Gregory Perkins, "Population Projections for Boston and the Boston City Hospital Area," Boston Redevelopment Authority, Research Department, Publication 241, September, 1985.

adjust upward slightly the number of young adults and downward the number of persons aged 85 years and older. Since the migration rates become more positive over time, the population grows relatively slowly in the 1980s and faster during the 1990s. Low Series rates were keyed to the changing migration rates for age groups between the 1970-1975 and 1975-1980 periods. Analysis of the 1970-1980 changes in migration rates by age and sex groups made use of several data sources including the 1970 and 1980 U.S. Censuses of Population, life table death rates by age, and gross migration flows by broad age groups for Suffolk County during the 1975-1980 period.⁴ The migration rates for the Low Series are shown in Table 8.

The Middle Series was constructed by using the population in age groups posited in the BCH projections as a guide, developing the migration rates that would yield approximately these populations. The rates selected were keyed to the Low Series rates in 1980 to 1985 and in 1985 to 1990 and then held constant at these rates to the year 2000. Specifically, it was assumed that net outmigration would be halved in each five-year period for those entering the 0-4, 5-9, 10-14, 30-34, and 35-39 age groups. Net outmigration was assumed to be the same as that for the Low Series in the age groups 40-44 through 80-84, and for the age group 25-29 through the year 1995 after which it is assumed to decline to 90 percent of the Low Series rate. Net immigration for those becoming 85 years and over was reduced to zero. Net immigration was increased to 160 percent of that in the Low Series for the 15-19 year group and reduced to 70 percent of the Low Series rate for those becoming 20-24 years. The migration rates for the Middle Series are shown in Table 9. These rates produce a population that grows relatively rapidly during the 1980s and 1990s.

The High Series net migration rates, shown in Table 10, were also keyed to the Low Series rates, halving the 1980-1985 net outmigration rates for all groups in the age ranges 0-4 to 10-14 and 25-29 through 80-84 for 1980 to 1990. These rates were held constant for those under age 15 during the 1990s. The rates for those aged 25-29 through 80-84 were increased to 55 percent and 60 percent of the 1980-1985 Low Series rates for 1990-1995 and 1995-2000, respectively. As in the Middle Series, net migration was held at zero for those aged 85 and over. Those groups that experienced net immigration in the 1970s were assumed to show even more positive rates. Net immigration for those 15-19 years of age was assumed to be 150 percent of that in the Low Series.

4. U. S. Bureau of the Census, 1970 Census of Population; Ibid., 1980 Census of Population; Ibid., 1980 census of Population, Supplementary Report, "Gross Migration for Counties: 1975 to 1980," PC80-S1-17; U.S. Department of Health, Education and Welfare, National Center for Health Statistics, Vital Statistics of the United States, 1975. Volume II, Section 5, "Life Tables."

Table 8. Five-Year Net Migration Rates* by Age and Sex for Boston.
Low Series, 1980-2000

Initial Age Groups	Final Age Groups	Net Migration Rates			
		1980-1985	1985-1990	1990-1995	1995-2000
Male					
Births	0-4	-0.0924	-0.0878	-0.0832	-0.0832
0-4	5-9	-0.0925	-0.0902	-0.0879	-0.0879
5-9	10-14	-0.0684	-0.0667	-0.0650	-0.0650
10-14	15-19	0.2510	0.3030	0.3500	0.3605
15-19	20-24	0.4763	0.4763	0.5000	0.5300
20-24	25-29	-0.0890	-0.0863	-0.0837	-0.0812
25-29	30-34	-0.1436	-0.1380	-0.1311	-0.1245
30-34	35-39	-0.1351	-0.1210	-0.1075	-0.1075
35-39	40-44	-0.0580	-0.0580	-0.0580	-0.0580
40-44	45-49	-0.0802	-0.0627	-0.0502	-0.0405
45-49	50-54	-0.0363	-0.0367	-0.0367	-0.0367
50-54	55-59	-0.0536	-0.0402	-0.0322	-0.0268
55-59	60-64	-0.0388	-0.0388	-0.0310	-0.0190
60-64	65-69	-0.0550	-0.0550	-0.0550	-0.0550
65-69	70-74	-0.0665	-0.0665	-0.0532	-0.0390
70-74	75-79	-0.0889	-0.0749	-0.0599	-0.0499
75-79	80-84	-0.0527	-0.0527	-0.0360	-0.0360
80-84	85+	0.0890	0.0890	0.0890	0.0890
85+		0.0890	0.0890	0.0890	0.0890
Female					
Births	0-4	-0.0964	-0.0916	-0.0868	-0.0868
0-4	5-9	-0.1059	-0.1032	-0.1006	-0.1006
5-9	10-14	-0.0674	-0.0657	-0.0640	-0.0640
10-14	15-19	0.3510	0.4200	0.4500	0.5300
15-19	20-24	0.5380	0.5380	0.5380	0.5500
20-24	25-29	-0.1090	-0.1057	-0.1025	-0.0994
25-29	30-34	-0.1576	-0.1474	-0.1400	-0.1330
30-34	35-39	-0.1345	-0.1301	-0.1157	-0.1157
35-39	40-44	-0.0574	-0.0574	-0.0574	-0.0574
40-44	45-49	-0.0650	-0.0482	-0.0386	-0.0314
45-49	50-54	-0.0268	-0.0271	-0.0271	-0.0271
50-54	55-59	-0.0662	-0.0450	-0.0360	-0.0331
55-59	60-64	-0.0498	-0.0498	-0.0398	-0.0240
60-64	65-69	-0.0465	-0.0465	-0.0465	-0.0465
65-69	70-74	-0.0727	-0.0727	-0.0582	-0.0430
70-74	75-79	-0.0808	-0.0684	-0.0547	-0.0456
75-79	80-84	-0.0635	-0.0635	-0.0410	-0.0410
80-84	85+	0.0890	0.0890	0.0890	0.0890
85+		0.0890	0.0890	0.0890	0.0890

Source: Boston Redevelopment Authority

* The net migration rates are the proportional net increase or decrease expected in a population cohort as it ages from the age group at the beginning of the period, shown in the first column, to the age group at the end of the period five years later, shown in the second column, for each five-year period.

Table 9. Five-Year Net Migration Rates* by Age and Sex for Boston, Middle Series, 1980-2000

Initial Age Groups	Final Age Groups	Net Migration Rates			
		1980-1985	1985-1990	1990-1995	1995-2000
Male					
Births	0-4	-0.0462	-0.0439	-0.0439	-0.0439
0-4	5-9	-0.0463	-0.0451	-0.0451	-0.0451
5-9	10-14	-0.0342	-0.0334	-0.0334	-0.0334
10-14	15-19	0.4016	0.4848	0.4848	0.4848
15-19	20-24	0.3334	0.3334	0.3334	0.3334
20-24	25-29	-0.0890	-0.0863	-0.0863	-0.0777
25-29	30-34	-0.0861	-0.0828	-0.0828	-0.0828
30-34	35-39	-0.0811	-0.0726	-0.0726	-0.0726
35-39	40-44	-0.0580	-0.0580	-0.0580	-0.0580
40-44	45-49	-0.0802	-0.0627	-0.0627	-0.0627
45-49	50-54	-0.0367	-0.0367	-0.0367	-0.0367
50-54	55-59	-0.0536	-0.0402	-0.0402	-0.0402
55-59	60-64	-0.0388	-0.0388	-0.0388	-0.0388
60-64	65-69	-0.0550	-0.0550	-0.0550	-0.0550
65-69	70-74	-0.0665	-0.0665	-0.0665	-0.0665
70-74	75-79	-0.0889	-0.0749	-0.0749	-0.0749
75-79	80-84	-0.0527	-0.0527	-0.0527	-0.0527
80-84	85+	0.0000	0.0000	0.0000	0.0000
85+		0.0000	0.0000	0.0000	0.0000
Female					
Births	0-4	-0.0481	-0.0458	-0.0458	-0.0458
0-4	5-9	-0.0529	-0.0516	-0.0516	-0.0516
5-9	10-14	-0.0347	-0.0329	-0.0329	-0.0329
10-14	15-19	0.5616	0.6720	0.6720	0.6720
15-19	20-24	0.3766	0.3766	0.3766	0.3766
20-24	25-29	-0.1090	-0.1057	-0.1057	-0.0951
25-29	30-34	-0.0946	-0.0884	-0.0884	-0.0884
30-34	35-39	-0.0807	-0.0781	-0.0781	-0.0781
35-39	40-44	-0.0574	-0.0574	-0.0574	-0.0574
40-44	45-49	-0.0650	-0.0482	-0.0482	-0.0482
45-49	50-54	-0.0271	-0.0271	-0.0271	-0.0271
50-54	55-59	-0.0662	-0.0450	-0.0450	-0.0450
55-59	60-64	-0.0498	-0.0498	-0.0498	-0.0498
60-64	65-69	-0.0465	-0.0465	-0.0465	-0.0465
65-69	70-74	-0.0727	-0.0727	-0.0727	-0.0727
70-74	75-79	-0.0808	-0.0684	-0.0684	-0.0684
75-79	80-84	-0.0635	-0.0635	-0.0635	-0.0635
80-84	85+	0.0000	0.0000	0.0000	0.0000
85+		0.0000	0.0000	0.0000	0.0000

Source: Boston Redevelopment Authority

* The net migration rates are the proportional net increase or decrease expected in a population cohort as it ages from the age group at the beginning of the period, shown in the first column, to the age group at the end of the period five years later, shown in the second column, for each five-year period.

Table 10. Five-Year Net Migration Rates* by Age and Sex for Boston, High Series, 1980-2000

Initial Age Groups	Final Age Groups	Net Migration Rates			
		1980-1985	1985-1990	1990-1995	1995-2000
Male					
Births	0-4	-0.0462	-0.0462	-0.0462	-0.0462
0-4	5-9	-0.0463	-0.0463	-0.0463	-0.0463
5-9	10-14	-0.0342	-0.0342	-0.0342	-0.0342
10-14	15-19	0.3765	0.3765	0.3765	0.3765
15-19	20-24	0.5239	0.5239	0.4763	0.4763
20-24	25-29	-0.0445	-0.0445	-0.0445	-0.0445
25-29	30-34	-0.0718	-0.0718	-0.0718	-0.0718
30-34	35-39	-0.0676	-0.0676	-0.0676	-0.0676
35-39	40-44	-0.0290	-0.0290	-0.0319	-0.0319
40-44	45-49	-0.0401	-0.0401	-0.0441	-0.0441
45-49	50-54	-0.0184	-0.0184	-0.0202	-0.0202
50-54	55-59	-0.0268	-0.0268	-0.0295	-0.0295
55-59	60-64	-0.0194	-0.0194	-0.0213	-0.0213
60-64	65-69	-0.0275	-0.0275	-0.0303	-0.0303
65-69	70-74	-0.0332	-0.0332	-0.0365	-0.0365
70-74	75-79	-0.0445	-0.0445	-0.0490	-0.0490
75-79	80-84	-0.0264	-0.0264	-0.0290	-0.0290
80-84	85+	0.0000	0.0000	0.0000	0.0000
85+		0.0000	0.0000	0.0000	0.0000
Female					
Births	0-4	-0.0481	-0.0481	-0.0481	-0.0481
0-4	5-9	-0.0529	-0.0529	-0.0529	-0.0529
5-9	10-14	-0.0347	-0.0347	-0.0347	-0.0347
10-14	15-19	0.5265	0.5265	0.5265	0.5265
15-19	20-24	0.5918	0.5918	0.5380	0.5380
20-24	25-29	-0.0545	-0.0545	-0.0545	-0.0545
25-29	30-34	-0.0788	-0.0788	-0.0788	-0.0788
30-34	35-39	-0.0673	-0.0673	-0.0673	-0.0673
35-39	40-44	-0.0287	-0.0287	-0.0316	-0.0316
40-44	45-49	-0.0325	-0.0325	-0.0358	-0.0358
45-49	50-54	-0.0136	-0.0136	-0.0150	-0.0150
50-54	55-59	-0.0331	-0.0331	-0.0364	-0.0364
55-59	60-64	-0.0249	-0.0249	-0.0274	-0.0274
60-64	65-69	-0.0232	-0.0232	-0.0255	-0.0255
65-69	70-74	-0.0364	-0.0364	-0.0400	-0.0400
70-74	75-79	-0.0404	-0.0404	-0.0444	-0.0444
75-79	80-84	-0.0318	-0.0404	-0.0350	-0.0350
80-84	85+	0.0000	0.0000	0.0000	0.0000
85+		0.0000	0.0000	0.0000	0.0000

Source: Boston Redevelopment Authority

* The net migration rates are the proportional net increase or decrease expected in a population cohort as it ages from the age group at the beginning of the period, shown in the first column, to the age group at the end of the period five years later, shown in the second column, for each five-year period.

For the 20-24 year olds, net migration was assumed to be 110 percent of the Low Series rate during the 1980s and 105 percent during the 1990s. This produced a very rapid rate of population growth during the 1980s and a somewhat lower, though still high, growth rate during the 1990s.

Most of the differences among the three series of projections is due to migration rather than to differences in births or deaths. Table 11 indicates the number of births, deaths, and net migrants estimated and projected by each of the three series.

Table 11. Estimated and Projected Births, Deaths, and Net Migrants for the City of Boston, Low, Middle, and High Series, 1980-2000

Series	1980-1985	1985-1990	1990-1995	1995-2000
Births				
Low	41,315	43,403	43,196	42,354
Middle	41,630	44,763	45,931	46,294
High	42,797	47,843	50,005	50,574
Deaths				
Low	29,146	25,534	25,146	24,647
Middle	29,309	25,198	24,674	23,963
High	29,912	25,872	25,965	25,746
Net Migrants				
Low	-3,542	-9,888	-12,038	-5,652
Middle	4,317	2,533	-2,423	2,308
High	25,425	16,406	4,980	5,537

Births. Births were imputed by using the general fertility rate: the number of births per 1,000 women of childbearing age, 15-44 years. Use of the general fertility rate is an accepted way of calculating births. It was deemed more expedient than calculating births based on age-specific fertility rates for each five-year age group of women between the ages of 15 and 44 years. The 1980-1985 general fertility rate for Boston was 52.5 per thousand. The actual number of births to Boston residents for this period numbered some 41,000. The projected number of births for each five-year interval for the three series are shown in Table 11.

However, use of 52.5 may lead to some overestimation of births in the time intervals following 1980-1985. The general fertility rate is calculated as the number of births relative to all women of childbearing age. As such, it lumps together and, in effect, provides a weighted average of the fertility of women at different ages who have very different rates of childbearing. Therefore, the accuracy of the 1980-1985 general fertility rate

Table 12. Five-Year Age-Sex-Period-Specific Life Table
Survival Rates, 1970-2000

Initial Age Groups	Final Age Groups	1975 5-Year LTSR ¹	Survival Rates			
			1980-1985	1985-1990	1990-1995	1995-2000
Male						
Births	0-4	0.9831	0.9863	0.9879	0.9886	0.9892
0-4	5-9	0.9905	0.9952	0.9976	0.9978	0.9979
5-9	10-14	0.9978	0.9983	0.9985	0.9986	0.9987
10-14	15-19	0.9952	0.9956	0.9958	0.9961	0.9962
15-19	20-24	0.9911	0.9920	0.9924	0.9926	0.9928
20-24	25-59	0.9898	0.9907	0.9912	0.9915	0.9917
25-59	30-34	0.9899	0.9906	0.9910	0.9913	0.9917
30-34	35-39	0.9880	0.9899	0.9907	0.9913	0.9917
35-39	40-44	0.9828	0.9860	0.9876	0.9883	0.9890
40-44	45-49	0.9732	0.9777	0.9800	0.9814	0.9825
45-49	50-54	0.9580	0.9640	0.9670	0.9694	0.9714
50-54	55-59	0.9355	0.9428	0.9465	0.9500	0.9532
55-59	60-64	0.9014	0.9145	0.9211	0.9249	0.9291
60-64	65-69	0.8567	0.8729	0.8810	0.8860	0.8907
65-69	70-74	0.7955	0.8159	0.8261	0.8320	0.8380
70-74	75-79	0.7083	0.7408	0.7570	0.7648	0.7716
75-79	80-84	0.6062	0.6417	0.6594	0.6689	0.6787
80-84	85+	0.2770	0.4463	0.5309	0.5439	0.5563
85+		0.1855	0.3006	0.3581	0.3713	0.3878
Female						
Births	0-4	0.9860	0.9875	0.9883	0.9889	0.9894
0-4	5-9	0.9922	0.9962	0.9982	0.9984	0.9985
5-9	10-14	0.9986	0.9989	0.9990	0.9991	0.9991
10-14	15-19	0.9980	0.9981	0.9982	0.9983	0.9984
15-19	20-24	0.9970	0.9972	0.9973	0.9974	0.9975
20-24	25-59	0.9964	0.9969	0.9971	0.9972	0.9973
25-59	30-34	0.9957	0.9962	0.9965	0.9967	0.9969
30-34	35-39	0.9939	0.9950	0.9956	0.9959	0.9962
35-39	40-44	0.9904	0.9924	0.9934	0.9938	0.9942
40-44	45-49	0.9850	0.9876	0.9889	0.9896	0.9902
45-49	50-54	0.9774	0.9801	0.9815	0.9827	0.9837
50-54	55-59	0.9664	0.9692	0.9706	0.9721	0.9736
55-59	60-64	0.9499	0.9548	0.9573	0.9590	0.9608
60-64	65-69	0.9284	0.9335	0.9361	0.9382	0.9405
65-69	70-74	0.8892	0.9011	0.9070	0.9106	0.9140
70-74	75-79	0.8214	0.8493	0.8632	0.8697	0.8754
75-79	80-84	0.7284	0.7654	0.7839	0.7949	0.8061
80-84	85+	0.3380	0.5531	0.6606	0.6792	0.6965
85+		0.2349	0.3826	0.4564	0.4784	0.4998

1. LTSR, Life Table Survival Rates

Source: U.S. Department of Health Education and Welfare, National Center for Health Statistics, Vital Statistics of the United States, 1975. Volume II, Section 5, Life Tables." U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 952 "Projections of the Population of the United States, by Age, Sex, and Race: 1983 to 2080," May 1984.

for the future time periods depends on both the fertility rates for age groups remaining constant into the future and for the distribution of women among the various five-year age groups in the 15-44 year age span remaining unchanged.

Recently there has been a shift upward of fertility rates among older women of childbearing age and a partially compensating slight shift downward among younger women nationwide.⁵ Since fertility rates are considerably lower among teenagers and women 35 years and older than they are for women in the middle years of childbearing the effect of these changes on the number of births is marginal.

In Boston, there has been an increase in fertility rates between 1980 and 1985 for younger and older women of childbearing age. However, the largest increase was among those aged 35-44. Their fertility increased by 39 percent between 1980 and 1985 while fertility rates for those under age 25 grew by 11 percent and for those 25-34 years by less than 10 percent. The increase among young women may be caused by a persistently higher rate of teenage pregnancy in the City of Boston, by the presence of minority women whose childbearing is spread out over a wider age range than is true for white mothers, and by variation in the low level of childbearing among younger women compared to national norms. Therefore, while these increases are noteworthy, it is expected that Boston's childbearing will be considerably lower and later than the national norms, as it has been for several decades.

An ongoing and more pervasive shift will occur in the age distribution of women of childbearing age, as women born during the baby boom years age out of the prime childbearing years and are replaced by a smaller number of women. By the end of the twentieth century, the baby bust will be firmly entrenched in the prime childbearing ages of 20-34 years. This will mean a shift from the age group 20-34 accounting for 63 percent of women 15-44 in 1980, to only 51 percent of women 15-44 in the year 2000. If age-specific fertility rates were to remain the same in 1995-2000 as they had been in 1980-1985, the shift in the age distribution would reduce the number of births by nearly 10 percent, a decrease of about 4,000 to 5,000 for all series between 1995 and 2000.

The changing age distribution of women might be offset either by a shift in childbearing from later years back to middle years or by higher fertility rates due to a larger proportion of women of childbearing age being members of minority groups. The general fertility rate used has a built in allowance for an increase in fertility rates.

⁵ "Teen-Age Pregnancy and Birth Rates Drop," The New York Times, October 20, 1987, p. A29.

Deaths. Deaths were computed for each age-sex group in each five-year period using the age-sex-period-specific life table survival rates used for projecting the population of the United States.⁸ The appropriateness of this series of survival rates was tested by comparing the actual number of deaths that occurred in Boston between 1980 and 1985 with the number implied by the life table survival rates. The error was 0.1 percent indicating a close fit to Boston's current mortality experience. It is assumed that these rates will produce a good approximation to Boston's actual mortality experience in the future. Table 12 shows these survival rates.

⁸ U.S. Bureau of the Census, Current Population Reports, "Projections of the Population of the United States, by Age, Sex, and Race: 1983 to 2080," P-25, No. 952, May 1984.

